

Poverty Determinants among Farmers in Ogun State, Nigeria

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Abstract: This study employed the Foster-Greer-Thorbecke (FGT) model, regression analysis and frequency counts to analyse poverty incidence, manifestations and determinants among 150 farmers in the Ijebu-North Local Government Area, Ogun State. In addition, the study presented the socio-demographic characteristics of the poor farmers in the sample, identified on the basis of an income-based poverty line measure. Results showed that among poor farmers, the poverty incidence was more for older and less for younger, farm operators. Further, the FGT measures indicated that poverty incidence, poverty depth and severity of poverty are 25.3, 23.3 and 21.5%, respectively. Farmlands fragmentation and farming experience showed significant, negative effect while age, level of education, level of capital borrowing, size of farmlands operated and household size indicated positive effect, on the poverty level among the sample. The effects were, however, significant for farmlands fragmentation, farming experience, the size of farmlands cultivated and the level of borrowing.

Key words: FGT, poverty, farmers, fragmentation, farmlands, Nigeria

INTRODUCTION

The importance of (rural) poverty is underscored by the fact that as much as 75 to 80% of national populations reside in rural areas in most developing countries (Akinbode, 1988). Although there is no universal definition of poverty, everyone seems to agree that it exists when one or more persons fail to attain a level of well-being deemed to constitute a reasonable minimum by the standards of that society (Ravallion, 1993). Poverty can be described as the level of deprivation that encompasses shortfalls or inadequacies in basic human needs, which prevent people from achieving internationally acceptable levels of well-being. This situation, which has been ascribed in some quarters to production failure owing to a suppression of markets and in some other quarters to distributional failure (Dasgupta, 1998), is characterised by disease, low life expectancy and physical and mental retardation. Consequently, absolute poverty reflects the condition of people who live below the poverty line or are too poor to obtain a calorie-adequate diet and as such do not have enough energy to earn a living.

Empirical evidence on the nature of poverty among rural farmers vis the extent of influence of the source of income on agricultural (rural) poverty and income inequality are quite essential for sound policy choices,

programme (and reform) management and welfare improvement in rural, predominantly agrarian, Nigeria. This of necessity entails the need to ascertain the incidence, depth and severity of poverty among rural inhabitants and farming poor and the influence of economic, social and demographic variables on poverty. This study, which is directed at providing empirical evidence on incidence/manifestations and causes of rural poverty, is carried out in Ijebu-North Local Government Area (LGA) of Ogun State, Nigeria. In particular, this study is focused on quantifying the living standard of the farmers in Ijebu-North LGA of Ogun State, Nigeria. Findings in the study are thus expected to prove useful especially in knowing and subsequently, comparing the living standard in the study area with the living standards in other parts of the country.

MATERIALS AND METHODS

The data for study were obtained with the aid of structured questionnaires. Due to the dearth of recent and adequate sampling frame of the target population (i.e., farmers) in the Ijebu-North LGA, Ogun State, a purposive random sampling procedure was followed in the field survey. One hundred and fifty questionnaires were thus administered in four major rural towns (i.e., clusters) drawn purposively the Ijebu-North LGA. These are Ago-

Iwoye, Oru, Awa and Ilaporu, which are predominantly agrarian communities with similar (rain-forest) vegetation and fairly equal distribution of farming populations. Non-farming populations including students and artisans in other occupations are, however, more prominent in Ago-Iwoye and Oru. The size of the target respondents (i.e., farmers) chosen randomly in each town was fifty, making a total of two hundred respondents targeted for the field survey. However, subsequent analysis in this study was based on complete information furnished by 150 farmers distributed as follows: 41 from Ago-Iwoye, 35 each from Oru and Awa and 39 from Ilaporu. Most of the farmers interviewed produced purely food (arable) crops while some produce cash crops. Only a few of the farmers produced a combination of both food and cash crops.

Both descriptive and quantitative analyses were carried out in the study. The descriptive analysis including ratio analysis, frequency counts and percentage analysis were used to describe the socio-economic and demographic characteristics of farmers and their households in the study area. Specifically, the size and composition of poor farmers' households, the mean household income as well as the sex and educational attainment of the farmers were analysed in the study.

Two fundamental questions that arise when measuring poverty are: How an individual's "standard of living" should be quantified; and relatedly, how a minimum acceptable standard, the poverty line, is to be determined (Ravallion and Huppi, 1991). In order to identify the poor farmers, among the study sample, the income-based relative poverty line approach was employed. Consequently, poverty was defined in terms of income distribution pattern among the sample. Ravallion and Bidani (1994) have further suggested other methods of constructing the poverty profile. However, using the relative poverty line approach, the incomes of individual farmers were compared with the mean income of a representative farmer among the sample. A farmer in the sample was classified as poor if the farmer's income, fall below 50% of the mean income of all farmers in the sample. Thus, following from Olubanjo (1998) the poor, in this study, is a farmer and hence farming household (including household members in the case of income pooling), with less than half the average income.

Further, to present the poverty profile of the all (poor and non-poor) farmers in the study area, various methods were used to estimate the extent and manifestations of poverty among the sample. Specifically, the headcount, poverty incidence and poverty gap measures were employed in the analysis. Headcount measure estimates the absolute number of the poor in the sample. Poverty incidence estimates the percentage of the

poor in the total sample. Poverty gap measures the intensity of poverty based on the extent of income shortfalls below the poverty line by the poor in the sample (Olubanjo, 1998). Specifically, the Foster-Greer-Thorbecke (FGT) measure of poverty, which allow for the quantitative measurement of poverty status (including the headcount measure, the poverty incidence and poverty gap) among sub-groups of the population was used in assessing poverty level among poor households in the study area.

The analysis of poverty status using FGT measure of poverty involves the ranking of incomes in the ascending order of magnitude such that:

$$Y_{1i} \leq Y_{2i} \leq \dots \leq Y_{qi} \leq Z_i \leq Y_{(q+1)i} \leq Y_{(q+2)i} \leq \dots \leq Y_{ni}$$

The FGT measure for the *i*th sub-group is given by:

$$P_{\alpha} = \sum_{i=1}^q ni(1 - Y_i / Z)^{\alpha} / N, \quad \text{for } \alpha = 0, 1, 2 \quad (1)$$

Where, α is a non-negative parameter; Y_i is income per person in the *i*th household; n_i is the size of the *i*th household; q is the number of households below the poverty line; Z is the poverty line value or threshold value of income; and N is the number of persons in the sampling population.

When $\alpha = 0$, it implies zero concern for poverty incidence or depth. Equation 1 then reduces to a headcount of poverty. That is,

$$P_{0i} = \sum_{i=1}^q ni(1 - Y_i / Z)^0 / N \quad (2)$$

When $\alpha = 1$, it conveys the information that there is uniform concern for poverty depth. Consequently, Eq. 2 becomes,

$$P_{1i} = \sum_{i=1}^q ni(1 - Y_i / Z) / N \quad (3)$$

Where g_i is the poverty gap between the *i*th poor household and the poverty line.

Following from Eq. 2 and 3 the income gap ratio, which measures the proportionate distance of the mean income of the poor below the poverty line is estimated as the ratio of p_{1i} to p_{0i} (i.e., p_{1i} / p_{0i}).

Finally, when $\alpha = 2$, it implies that a distinction is made between the poor and poorest. Equation 1 then reduces to the FGT index, which is a distinctive index of the severity of poverty. FGT for the *i*th group is given as:

$$P_{2i} = \sum_{i=1}^n ni(1 - Y_i/Z)^2 / N \quad (4)$$

In order to analyse the determinants of poverty among households in the study area, the regression function of the form below was fitted to the study data using the ordinary least squares method.

$$Y_i = f(X_{1i}, X_{2i}, X_{3i}, \dots, X_{mi}) \quad (5)$$

Where, Y_i is the poverty index for the i th farming household in the sample. It measures the ratio of the household's income to the poverty line. X_{1i} is the age of the i th farm-household head (in years). X_{2i} is the educational attainment of the i th farm-household head (in years). X_{3i} is the household size of the i th farming household. X_{4i} is the farm holding of the i th farming household (in hectares). X_{5i} is the borrowings by the i th farming household. X_{6i} is the income of the i th farming household (₦). X_{7i} is the farming experience of the i th farm-household head (in years). And X_{8i} is the level of land consolidation by the i th farming household measured by the Simpson Index (Blarel *et al.*, 1992; Olubanjo *et al.*, 1999). That is,

$$I = 1 - \frac{\sum_{i=1}^n A_i^2}{A^2} \quad (6)$$

Where, A_i is the area (in hectares) of the i th farming household's farm plot (or parcel). A is the total farm area (in hectares) for the i th farming household.

$$A = \sum_{i=1}^n A_i^2$$

RESULTS AND DISCUSSION

The poverty line: From preliminary analysis, the mean income of all (poor and non-poor) farmers was N51,956.50 per annum. The relative poverty line was thus defined based on total incomes of the farmers. The poverty line is an income-based threshold line that divides the poor and the non-poor farmers in the study area. For the sample chosen, the value of the poverty line is N25, 978.25 per annum. Consequently, farmers that earned less than half the average income or that earned incomes, which fall below 50% of the mean income, were considered to be poor. Out of the 150 farmers contacted, only forty-one or 27.33% were deemed to be poor. This estimate is comparable to 24.4% obtained for rural residents surveyed

in Ogun State based on the income-poverty line measure (Olubanjo, 1998). Also, tests of the difference of the means of the socio-demographic variables for the poor and non-poor further revealed that poor farmers (and households) in the sample differed significantly from the non-poor in terms of farm and household incomes, farmland endowment and the poverty index. However, since this study is focused partly on presenting the profile of the poor farmers in the study area, the discussion in the next section is based solely on the results of the descriptive analysis carried out based on data for the poor farmers (i.e., forty-one) identified in the study sample. The focus on poor farmers becomes justified since most poverty remains rural (White and Killick, 2001). Analysis of the rural poor farming population should thus constitute the starting point in poverty (and livelihoods transformation) discussion.

Sociodemographic characteristics of poor farmers:

Analysis of the socio-demographic characteristics of the poor farmers indicated that majority (i.e., 34%) of them were above 60 years of age, while those within the 31 to 50 year age bracket constituted about 27% (Table 1). Overall, farmers who were above 50 years old formed two-thirds (or about 66%) of the poor in the sample. This tends to confirm that poverty incidence was more among the older farmers and less among the younger ones.

Majority (i.e., about 54%) of the poor farmers had no formal education (Table 1). Besides, about 85% of the poor farmers had no more than primary education. This tends to confirm the poor literacy level among poor farmers in the study sample. Also, majority (i.e., about 56%) of the poor farmers had six to ten members residing within the households. Overall, 68% of the poor farmers in the sample had at least six members living within their households. Poor farming households thus tend to maintain large family size, obviously to meet the usual large labour needs during the farming season. Both findings agreed with the profile (i.e., poor education and large family size) of the rural poor in Africa given by White and Killick (2001).

The modal land size category among poor farmers in the study area was 0.6-1.0 hectares (Table 1). About 49% of the poor farmers operated farmlands, which size fall within the range 1.1-1.5 hectares. About 15% of the farmers, however, operated farmlands, which total area, were not more than 0.5 hectares. This poor land endowment, which is typical of the rural poor (White and Killick, 2001), can be expected to limit the ability of poor farming households to earn good incomes so as to enjoy sustainable livelihoods. This is more so, when access to cultivable land, is one crucial element in rural poverty in Africa (White and Killick, 2001).

In the 2000 agricultural season, majority (i.e., about 56%) of the poor farmers operated only in one farm location (i.e., as consolidated holdings). This evidence tends to suggest that most poor farmers operated consolidated holdings. This may be due to their inability to secure and operate non-contiguous (or scattered) farm holdings during the season. This is despite the high risks associated with operation of single farm holding. Food security consideration and population pressure are two important factors encouraging operation of scattered farm plots (Idowu and Oladeebo, 1998/1999). Overall, three quarters of the poor farmers covered at least 5 km between home and farm. Farmlands scarcity may be responsible for this. Consequently, transportation needs (and costs) may have to be met so as to reduce the drudgery, waste of time and risks associated with cultivating farmlands in remote locations.

Unsurprisingly, almost all (95%) of poor farmers in the study sample borrowed money to cultivate their farms as well as to sustain the family livelihoods. This tends to confirm the earlier perception of the poor in Nigeria “as lacking security and being perpetually in debt

and constantly having to borrow (Ali-Akpajiak and Pyke, 2003). Seventy-three% of the poor farmers had the gross value of production that was not more than N50,000.00 during the farming season. Besides, 80% of the farmers had their total farm income below ₦10,000.00, with the mean annual income among the poor farmers being ₦14,663.41 for the 2000 farming season. Most of the poor farmers earned less than ₦833.33 per month, thus confirming their poor status.

Extent and manifestations of poverty: To determine and describe the extent and manifestations of poverty among all farmers (i.e., poor and non-poor farmers), the FGT measures of poverty were employed. The FGT model allowed the estimation of the headcount, the poverty incidence and the poverty gap for the sample. Table 2 presents the results of the poverty analysis using the FGT model. When $\alpha = 0$, it implies that there is zero concern for poverty incidence or depth. The poverty measure given by P_{0i} then reduces to the headcount measure of poverty. For the poor farmers, the P_{0i} value was 0.253. This implies that 25.3% of the respondent farmers were actually poor. This proportion invariably represents the poverty incidence among the sample and expectedly agreed with the earlier estimation of the proportion of the poor farmers (i.e., 27.3%) in the sample based on the poverty line definition.

When $\alpha = 1$, it conveys that there is uniform concern for poverty depth among the study sample. The P_{1i} value for the poor farmers in the sample was 0.233. This implies that poor farmers required 23.3% of the poverty line to get out of poverty. The value of the poverty gap for the poor farmers in the sample is thus ₦6,052.93 (or 0.233 multiplied by ₦25,978.25).

Finally, when $\alpha = 2$, it implies that a distinction is made between the poor and the poorest. This follows

Table 1: Summary statistics of poor farmers and their households in the Ijebu-North LGA, 2000

Socio-demographic characteristics	Frequency	Percent
Age (yrs):		
≤30	3	7.32
31-40	5	12.20
41-50	6	14.63
51-60	13	31.70
>60	14	34.15
Sub-total	41	100.00
Educational attainment:		
No schooling	22	53.66
Primary education	13	31.70
Secondary education	2	4.88
Tertiary education	4	9.76
Sub-total	41	100.00
Household Size:		
≤5	13	31.70
6-10	23	56.10
11-15	5	12.20
Sub-total	41	100.00
Size of farmlands cultivated (Ha):		
≤0.5	6	14.63
0.6-1.0	20	48.78
1.1-1.5	9	21.95
1.6-2.0	5	12.20
>2.0	1	2.44
Sub-total	41	100.00
Annual gross value of production (N'000):		
<50	30	73.17
51-100	9	21.95
101-150	1	2.44
151-200	1	2.44
Sub-total	41	100.00
Annual net farm income (N'000):		
<10	33	80.49
10 and <15	1	2.44
15 and <20	5	12.19
>20	2	4.88
Sub-total	41	100.00

Source: Field Survey, 2000

Table 2: Foster-Greer-Thorbecke (FGT) class of poverty measures for the study sample, 2000.

FGT measures	Poor farmers
1. When $\alpha = 0$,	
$P_{0i} = \sum_{i=1}^q ni(1 - Y_i / Z)^0 / N$	$\frac{294}{1164} = 0.253$
2. When $\alpha = 1$,	
$P_{1i} = \sum_{i=1}^q ni(1 - Y_i / Z) / N$	$\frac{270.9}{1164} = 0.233$
3. When $\alpha = 2$,	
$P_{2i} = \sum_{i=1}^q ni(1 - Y_i / Z)^2 / N$	$\frac{250.5}{1164} = 0.215$

Notes: N-Number of people (i.e., household members) in the sample or respondent- population = 1,164. Z - Poverty line value = N25,978.25

since the poverty gap or depth is not sensitive to re-distribution among the poor. The assumption with the poverty gap is that a Naira gained by the poor would have the same effect on poverty as that gained by the moderately poor. As such, to capture the sensitivity to income re-distribution among the poor and non-poor, there exists the need to estimate the severity of poverty among the study sample. The P_{2i} value for the poor using the FGT model was 0.215. This conveys that the severity of poverty among the poor farmers in the study area is 21.5%.

Determinants of poverty: The result of the regression analysis is provided in Eq. 7. The goodness of fit (R^2 value) indicates that only 24% of the variation in the poverty index was explained by the independent variables. The low R^2 value notwithstanding, the variables representing farming experience and land fragmentation (as measured by the Simpson's Index) indicated significant, negative influence on poverty level. Operation of fragmented holdings (as opposed to farmlands consolidation) and increase in farm knowledge and farming experience can thus be expected to reduce the poverty level among the study sample.

On the contrary, however, age and level of education of the individual farmers as well as the level of capital borrowing, size of farmland operated and household size indicated positive influence on the poverty level of the sampled farmers. The effect was, however, significant for the size of total farmland cultivated and the level of borrowing during the farming season.

$$\begin{aligned}
 Y_i = & 0.519 + 0.013X_{1i} + 0.016X_{2i} + 0.047X_{3i} \\
 & (0.783) \quad (0.855) \quad (0.584) \quad (1.050) \\
 & + 0.800X_{4i} + 0.030X_{5i} - 0.026X_{7i} - 0.010X_{8i} \\
 & (3.974)^* \quad (3.201)^* \quad (-2.193)^* \quad (-1.588)^*
 \end{aligned} \tag{7}$$

$R^2 = 0.24$; Adjusted $R^2 = 0.21$; F-statistics = 6.51*. t-values are in the parentheses.

*Coefficient/diagnostic statistics significant at the 10% level.

As such, the higher the size of the farmland cultivated, the higher the poverty level that will be recorded among the farmers in the study area. Although this finding is contrary to *a priori* expectation in the study, it tends to convey the likelihood of resource (i.e., capital) constraints typically faced by African farmers (White and Killick, 2001) and low productivity (Rahji, 1999), obviously due to management problems and unfavourable weather and soil conditions, resulting from operation of their farmlands. Consequently, a drastic improvement in the size of farmlands without commensurate improvement in resource endowment and

focused extension services may not result in any appreciable improvement in the level of poverty among (poor) farmers in the study area.

Similarly, the findings in the study suggest that improving access to borrowed funds or increasing the level of credit provision to farmers in the study area might not lower the poverty status. This could especially be so where borrowed funds are used for pure consumption purposes as opposed to being invested in income-generating activities. Where limited access to farmlands exists, economic use of borrowed funds should be least expected. Moreover, operation of fragmented farm holdings has the potential of lowering risks associated with cultivating farmlands in one location and reducing the level of poverty among the sample.

CONCLUSION

This study has analysed the incidence, manifestations and causes of rural poverty in the Ijebu North Local Government Area of Ogun State, Nigeria. One hundred and fifty respondents were randomly enumerated in four communities; viz., Ago-Iwoye, Oru, Awa and Ilaporu. Descriptive and regression analyses were carried out with the study data. The Foster-Greer-Thorbecke (FGT) model, which allowed for the quantitative measurement of poverty status among sub-groups of the population, was used in assessing poverty level among farmers /farming households in the study area. For poor farmers, results indicated that the incidence of poverty was more among older farmers and less among younger farmers. Besides, all poor farmers, borrowed to finance farm production and sustain family livelihoods while eighty% of them earned below N10,000.00 per annum. Results of the analysis of the FGT model showed that 25.3% of the respondents were poor. Based on the indices of the poverty depth, poor farmers required 23.3% of the poverty line (or ₦6,052.93) to escape poverty. The estimate of the severity of poverty among the poor farmers was 21.5%.

Finally, regression analysis has shown that farmlands fragmentation and increased farm knowledge and experience would improve (i.e., lower) the poverty level. However, the size of the farmlands cultivated and the borrowing level both significantly and positively influenced (i.e., worsened) the level of poverty; hence suggesting likelihood of resource constraints (e.g., small farm holdings) and loan fungibility (i.e., loan diversion for consumption, among other purposes), which may contribute to low productivity and incomes from individual farm operations. As such, any improvement in land access or farm size distribution without an

enhancement of the resource base (and especially borrowed fund management) may not yield any appreciable transformation of the status of farmers or their households in the study area. Extension officers and loan agencies thus have very significant roles to play especially in improving on farmers' knowledge, access to and use of funds.

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